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NEW COSMETIC COMPOSITIONS CONTAINING SPHINGOMYELINS AND OTHER COMPLEX LIPIDS
[NOUVELLES COMPOSITIONS COSMÉTIQUES CONTENANT DES SPINGOMYÉLINES ET AUTRES LIPIDES COMPLEXES]

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TITLE (54): NEW COSMETIC COMPOSITIONS CONTAINING SPHINGOMYELINS AND OTHER COMPLEX LIPIDS

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Specification /1*

Epidermal lipids consist of phospholipids, sphingolipids, sterols, fatty acids and neutral lipids. Although the cells of deeper layers of the epidermis (basal layer, *stratum spinosum*) possess lipid membranes essentially composed of phospholipids (phosphatidyl choline, phosphatidyl ethanol amine, etc.), more than 50% of the membranes of the corneocytes in the upper layers (*stratum corneum*) as well as the intercellular double layers (cellular cement) consists of sphingolipids and simple ceramides. The ceramides are of interest because of their great chemical stability and their capacity to assure the cutaneous barrier function. Thus, sources of ceramides for cosmetic applications are sought: to supply the skin with natural lipids (obtained by extraction) or (synthetic) lipids identical to natural ones is a goal of cosmetic research.

Currently several obstacles are blocking the realization of this goal; the chemical synthesis of ceramides is possible on a laboratory scale, but too expensive on an industrial scale. The extraction of natural sphingolipids (glycosyl ceramides, gangliosides) on an industrial scale is possible, even at reasonable costs. Cow brains are the major source of sphingolipids. After the appearance of bovine spongiform encephalitis (BSE) in Europe, mammalian animal (bovine and others) extracts in cosmetics are clearly less accepted, brain

*Numbers in the margin indicate pagination in the foreign text.

sphingolipids (from cattle or other mammals) must be replaced by lipids from other sources in order to formulate luxury products.

Plants do not contain sufficient sphingolipids or ceramides for economical extraction.

The object of the present patent is the utilization of certain fractions of natural lipids from milk and fish in cosmetic products. The lipids concerned in this patent (essentially fat globule membrane lipids from cow's milk and the complex lipids extracted from fish) come from a harmless source in the sense described above, are extractable at reasonable cost, and contain a high proportion of phospholipids (30-50%).

These phospholipids are naturally composed of phosphatidyl /2 choline (lecithin) (35-40% of the phospholipids), phosphatidyl ethanol amine (20-25%), and sphingomyelins (5-25%).

The amount of free ceramides in these lipids is negligible.

However, supplying a high amount of sphingomyelins to the skin makes it possible to reconstitute the reservoir of natural ceramides; the enzymes of the skin, in particular the extracellular sphingomyelinases (demonstrated by Bowser and Gray, 1978, J. Invest. Dermatol. 70, 331-335) can, in fact, convert the sphingomyelin into ceramide.

In order to demonstrate this reaction, we made a purified sphingomyelin act on acetone-insoluble extracts of milk lipids. By monitoring the enzymatic reaction by means of thin film

chromatography, it was possible to demonstrate the transformation of the sphingomyelins into ceramides. The other phospholipids (phosphatidyl choline and ethanol amine) are not modified.

By incorporating the lipids of membranes of fat globules of milk in cosmetic compositions in different forms, that is: emulsion, ointment, oil, or dispersion, products rich in ceramide precursors are obtained.

This application of ceramides to the skin leads to a better hydration, an improvement of the “barrier” function (decrease of the skin loss by transdermic evaporation) to a regeneration of the lipid layers of the stratum corneum and therefore to a smoothing of the wrinkles and little lines, and better elasticity.

As an example, a hydrating cream was formulated with and without addition of lipids rich in milk sphingomyelins:

	Cream A	Cream B
glyceryl stearate (and) PEG-100 stearate	5.50	5.50
dimethicone	1.00	1.00
mineral oil (and) lanolin alcohol	1.00	1.00
acetylated lanolin alcohol	1.50	1.50
cetyl alcohol	0.75	0.75
beeswax	0.75	0.75
octyl-palmitate	6.00	6.00
isopropyl myristate	2.00	2.00
cetearyl octanoate	3.00	3.00

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p-hydroxybenzoate mixture	0.30	0.30
milk fat globule lipids	2.00	-
demineralized water	q.s.p. 100	q.s.p. 100
Carbomer-940	0.20	0.20
triethanol amine	0.20	0.20

After a panel of 20 volunteers used cream A for a period of 3 weeks (daily application on the face), the clinical and objective examination of the skin reveals an improvement of its state: faded wrinkles, less dry, less stretched skin. Cream B did not produce a significant change.

The lipids that are the object of the patent are obtained by extraction and successive fractionation with organic solvents (chloroform, acetone, ethanol, methanol, or other solvents usually used by experts in the field) either of the total lipids of mammalian milk (preferably from cows, but also from goats, sheep, or mares, or fatty fish materials obtained from fresh fish, fish oil, or fish meal), followed by stages of concentration and deodorization. Their composition can vary, according to the mode of fractionation, within a considerable range; the essential component being the sphingomyelin fraction, which must be between 3 and 99.9% of the lipid material. A typical mixture contains between 10 and 40% of phosphatidyl choline, between 5 and 30% of phosphatidyl ethanol amine, and between 5 and 35% of sphingomyelin.

The milk or fish sphingolipids thus obtained at different degrees of purification, associated or not with other polar or apolar fish or milk lipids, can be used in any form of cosmetic products , for example; water/oil, oil/water, milks, lotions, gels, pommades, make-up products, lip sticks, or deodorant sticks.

They can be used in concentrations going from 0.01 to 30%, /4 preferably between 0.5 and 10%, according to the degree of purification of the sphingomyelins.

In order to use the finished products, these lipids can be presented in the form of an aqueous dispersion, paste, powder, ointment, oil. They can be advantageously included in cosmetic supports such as micro- or nano-particles, micro- or nano-capsules. They can be adsorbed on porous supports such as microsponges, silicates, bentonites, talcs, polyamides, or polyacrylates.

CLAIMS /5

1. Cosmetic compositions containing sphingolipids from milk of fish as natural precursors of ceramides.

2. Cosmetic compositions according to Claim 1, wherein the sphingomyelins from milk or fish are used in the pure state or associated with other polar or apolar lipids from milk or fish, constituting part of the membranes of milk fat globules or of the fatty material extractable from fish.

3. Cosmetic composition according to Claims 1 or 2, wherein the sphingomyelins or mixture thereof with other lipids from milk or fish are obtained by extraction and fractionation with organic solvents from cow's milk, sheep's milk, or mare's milk or from fresh fish, fish oil or fish meal.

4. Cosmetic compositions according to Claims 1 to 3, wherein the sphingomyelins or mixture thereof with other milk or fish lipids are used in the form of powder, paste, aqueous dispersion, ointment, or oil.

5. Cosmetic compositions according to Claims 1 to 4, wherein the sphingomyelins or mixture thereof with other lipids from milk or fish are used in concentrations between 0.01 and 30%, preferably between 0.5 and 10%, according to the degree of purification of the sphingomyelins.

6. Cosmetic compositions according to Claims 1 to 5, wherein the sphingomyelins or mixture thereof with other milk or fish lipids

contain a mixture of phosphatidyl choline (10-40%), phosphatidyl ethanol amine (5-30%), and sphingomyelin (5-35%).

7. Cosmetic compositions according to Claims from 1 to 6, /6 wherein they represent all forms of cosmetic products, that is, water/oil, oil/water emulsions, milks, lotions, gels, pommades, make-up products, lip sticks, and deodorant sticks.

8. Cosmetic compositions according to Claims from 1 to 7, wherein the milk lipids, can be included in cosmetic vectors such as micro- or nano-particles, micro- or nano-capsules, or they can be absorbed on porous supports such as microsponges, silicates, bentonites, talcs, polyamides, or polyacrylates.